Implementing Educational Technology in Higher Education:
A Strategic Approach

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Abstract

Although the move toward implementing technology in higher education is driven by an increasing number of competitors as well as student demand, there is still considerable resistance to embracing it. Adoption of technology requires more that merely installing a product. This paper outlines a framework for a strategic change process that can be utilized by educators for the purpose of the selection as well as successful implementation of educational technologies within their setting, in particular, online course management systems. The four steps of this process include strategic analysis, strategy making, strategic plan design, and strategic plan implementation. The choice to embrace a new system and the extent and speed of its implementation depends upon internal factors such as resources, organizational culture, faculty readiness, anticipated degree of resistance, and the degree of variance from the status quo. A case from the author's experience provides one example of how the use of distance learning technology was strategically implemented.

Introduction

It has been proposed that the key to the continued viability of institutions of higher education in light of increased competition in the global marketplace will be their adoption of learning technologies that increase flexibility, access and convenience (Smith & Oliver, 2000). Today, educators have a wide array of technologic tools to choose from, all designed to enhance the learning experience. Modalities range from electronic mail and integrated web-based course management systems such as WebCT or Blackboard, to gaming, simulations, and virtual scenarios. Although the move toward implementing technology is driven by an increasing number of competitors as well as student demand, its implementation should not be considered a panacea which results in superior outcomes each time. Even though technology has become a ubiquitous part of everyday life, there is still considerable resistance to embracing it within the realm of higher education. The implementation of educational technology can range from one that is very successful to one that is an abysmal failure (Lofstrom & Nevgi, 2007). In an effort to increase the likelihood of successful adoption, the selection and integration of technology must be accomplished in a manner that is consistent with mission and strategy such that learning is enhanced but organizational priorities and identities remain intact (Bonk, Cummings, Hara, Fischler, & Lee, 1999; Gilbert, 2000).

This paper outlines a framework for strategic decision making as introduced by Worley, Hitchen and Ross (1996) that can be utilized by educators for the purpose of the selection as well as implementation of educational technologies within their setting. Of considerable interest within the planning process is how to overcome organizational as well as personal resistance to technology. A case from the author's experience provides one example of how the use of distance learning technology was strategically implemented.

The strategic change process

Strategic change involves not only deciding what to change but how and when to change specific elements of one's strategic orientation (Worley, Hitchin, & Ross, 1996, p. 16). This change may be driven by dramatic changes within the environment, declining organizational performance, or perhaps even both. Within the realm of higher education, strategic planning can be considered as steering the university's teaching activities such that they are in alignment with organizational

mission and vision (Lofstrom & Nevgi, 2007). As the list of online educational providers grows, those organizations which have not considered offering this type of education already may be forced into a position which causes them to think about the adoption of educational technologies as a path to survival in the future.

The strategic change process encompasses four basic steps as follows (Worley, et. al., 1996):

- *Step one: Strategic analysis* - analysis of an organization's external environment, its current strategic orientation, and the degree of its effectiveness at meeting its objectives and mission.
- *Step two: Strategy making* - begins with the decision to change its vision and orientation in the future and includes defining the products and services to be offered, specifying the markets to be served, developing a position to be competitive in those markets, and assessing the underlying organizational processes and culture that will either enable or inhibit the change.
- *Step three: Strategic plan design* - defines how the change process will be logistically accomplished through sequencing and pacing in light of the prevailing culture as well as anticipated resistance.
- *Step four: Implementation of the plan* – transition to the new orientation which includes developing budgets and timetables, assigning roles and tasks that will guide the process, garnering commitment to ensure that there is a high level of ownership in the process, communicating to ease uncertainty, and allocating resources for support.

Step one: Strategic analysis

Although the causes of strategic change within the business context are limitless, they can be arranged into four major categories: transition to a global economy, changing industry structure and competitive conditions, suboptimal or declining organizational performance, and stakeholder initiatives (Worley, et. al., 1996). Many of these conditions are relevant to the world of higher education as well and their impact has already caused a shift in the way that learning is accomplished. In most of the world, higher education is mired in a crisis that mixes three issues: access, cost, and flexibility (Daniel, 1997). The technological advances that have enabled

globalization in the business world have also enabled the adoption of educational technologies that can increase access in a cost effective manner and facilitate learning beyond the walls of the traditional classroom to reach any student around the world (Dutton & Loader, 2002; Tiffin & Rajasingham, 2003). However, increased access has also resulted in increased competition for many traditional institutions of higher learning as geographic barriers to entry no longer exist.

The students or key stakeholders in this process have fundamentally changed as well. The students entering universities for the first time today are part of the first generation to grow up immersed in digital technology from the time that they were born. These "digital learners" think and process information fundamentally differently than their parents or teachers, and technology, in their world, is not considered a luxury but a necessity (Prensky, 2001a, 2001b). Learners throughout the world are demanding "anytime, anywhere" educational formats and many institutions are striving to meet that need (Schrum & Hong, 2002). Those institutions who wish to effectively accommodate the "neomillennial learning styles" of students born after 1982 must make an appropriate shift in technology infrastructure and development to do so (Dede, 2005). The transition to "wherever, whenever" education, necessitates a shift in the thinking of most traditional educators as well, from a focus primarily on teaching to one of learning. The knowledge media itself changes the nature of the fundamental relationship between an individual and knowledge, and lessens the need for a professor or "interpreter." In addition, those college graduates lacking competency in common technological applications will be at a disadvantage when seeking employment (Crebert, Bates, Bell, Patrick, & Cragnolini, 2004; Davis, 1997).

Step two: Strategy making
The choice to change may be stimulated by answering two questions (Worley, et. al., 1996): *"is a major environmental shift occurring and will it permanently alter the base of competition for a long time?"* and *"is performance suffering (as evidenced by declining enrollments, decreases in student satisfaction, etc.)?"* Based on the nature of the current environment as described previously, the answer to the first question is unequivocally, yes. The issue of performance however, may or may not be directly impacted by the current environment - yet. The decision to implement educational technology in addition to determining the extent of its adoption may not only depend on student demand or increased competition, but also upon internal factors such as

faculty readiness and the prevailing organizational structure, systems and culture. Although numerous articles, books, and professional learning groups support the adoption of educational technologies, faculty engagement with technology has been reported to be a relatively slow process. As strategy is formulated, one must consider potential individual barriers to adoption of technology (Miller, Martineau, & Clark, 2000; Bjarnason, 2003; Surry & Land, 2000) such as:

- Lack of technological literacy or competency of the faculty member
- Fear on the part of faculty members that students are more adept at the technology than they are
- Inertia and comfort with traditional delivery methodology
- Belief that learning is more effective in the classroom
- Time commitment to learn the new technology which competes with other demands such as advising, research and service
- Threat to academic freedom and autonomy

The success of implementation will also depend upon the extent that organizational factors such as existing leadership, structures, processes, and culture either support or constrain the process (Hannan, 2005). Organizational factors that have been shown to enhance the adoption of learning technologies include:

- Support of technology by an authority figure such as department head or dean
- High regard and support for teaching within the institution. Organizations which provide for parity of teaching activities with research endeavors through the use formal policies and maintenance of equity within the promotion and tenure process are more likely to experience a higher degree of adoption.
- High degree of sharing of learning outcomes between colleagues and others in leadership positions
- Support of e-learning activities via allocation of resources in some manner

Conversely, organizational factors that have been shown to inhibit the success of adoption include the following (Hannan, 2005; Surry & Land, 2000; Surry, Ensminger, & Haab, 2005; Bjarnason, 2001, 2003):

- Lack of leadership to support the transition
- A culture strongly rooted in traditional delivery formats such as lecture
- Low regard for teaching and learning within the institution in comparison with research and scholarship
- Lack of recognition or interest from colleagues or others in positions of authority
- Lack of willingness to share best practices
- Lack of incentive to adopt or become proficient with new technology
- Institutional policies which limit experimentation with alternative approaches to teaching
- Excessively bureaucratic processes for obtaining approval, support, or resources
- Quality assessment procedures which encourage conformity and inhibit risk taking
- Lack of faculty involvement in the selection and implementation process
- Lack of adequate infrastructure to support the technology

When deciding upon new technologies, one must assess the constraints and supports to adoption within their own institution and consider them as crucial to the process. One needs to consider breadth (the range of technologies or services to be provided), aggressiveness (the degree of competitiveness), differentiation (the degree of similarities or difference between the services offered by the organization compared to the services of other providers), logic (consistency of choices with known internal and external economic principles), and orchestration (how changes will be carried out) (Lawler & Worley, 2006). The choice to pursue new technologies as well as the extent of adoption may be dependent upon the anticipated degree of internal resistance as well as degree of variance from the current operation.

Once a strategy has been decided upon, one can assess its potential viability by considering the following questions (Hambrick & Fredrickson, 2005; Worley, et. al., 1996; Bonk, et.al, 1999; Bjarnason, 2001):

- Does the strategy fit with the nature of the external environment?
- Is it consistent with the overall institutional mission?
- Does it exploit key resources and competencies within the organization?
- Will the initiatives planned to differentiate your organization from other competitors be sustainable over time?
- Are the elements of the strategy internally consistent (do they all fit and mutually reinforce each other)?
- Does the organization have the resources to pursue this strategy?
- Is the strategy feasible and implementable?

If the answers to many of the above questions are no, then one must re-evaluate possible alternatives.

Step three: Strategic plan design

The specific choice to pursue new technology and the extent and speed of its implementation depends upon internal factors such as resources, organizational culture, faculty readiness and anticipated degree of resistance, how widely the new way of practice varies from the status quo, and external factors such as student demand, urgency of implementation, and potential target markets of interest. Once a technology has been chosen and installed however, it is not guaranteed that faculty will embrace it spontaneously (Surry & Land, 2000). Anticipation of resistance and plans for working through it should be an integral part of the design process. If the organization aims to expand its reach into new markets such as non-traditional students, executives, adult learners, or those students geographically unable to attend campus, a different implementation schedule will be required than if the organization is aiming at merely better serving their current student clientele. An aggressive expansion strategy will clearly require a larger commitment of time and resources than merely a service "upgrade." If organizational characteristics suggest a strong degree of inertia, a large deficit in technological ability, a significant degree of resistance to innovation, or minimal organizational resources, a much more limited initiative should be considered. One such approach can be to begin a small manageable implementation using a pilot group comprised of a few enthusiastic faculty members (Hambrick

& Fredrickson, 2005; Worley, et. al., 1996). The likely success will enhance positive regard for the project, disseminate support, reduce discouragement and increase credibility.

Additional changes within the organizational system can also facilitate a more successful transition. The ARCS model (Surry & Land, 2000), which stands for Awareness, Relevance, Confidence, and Satisfaction can be used as a way to increase acceptance and adoption of the new technology. This framework, based on motivational theory, suggests increasing *awareness* by offering showcases, demonstrating *relevance* through retention, promotion, and tenure decisions, building *confidence* through support and mentoring activities, and increasing *satisfaction* via rewards and incentives. Possible incentives can include release time, stipends, mini-grants, teaching with technology awards, upgrades to current hardware or software, travel to conferences to present work, or support for publications that showcase technology adoption. Changes within the promotion and tenure process that recognize innovation in teaching or adoption of technology will also serve to communicate the importance of technology as well as commitment to its adoption.

Merisotis (2001) also advocates the establishment of quality benchmarks as one plans the adoption of technology, particularly if online programs are intended. Benchmarks may include standards for course development, course structure, instructional delivery process, outcomes assessment and evaluation, and technical support mechanisms for student and faculty.

Step four: Implementation of the plan
The implementation phase involves the actual transition to the new technology and includes supportive activities such as developing timetables, assigning roles and tasks that will guide the change process, easing uncertainty by communicating what is changing and why, garnering commitment to ensure that there is a high level of ownership in the process, and allocating resources for support. Those faculty members who have shown an interest in technology in the past can be enlisted in the process to serve as early adopters, role models, and ultimately supporters of the initiative. The early adopters may also assist in raising awareness and acceptance of the new technology by "spreading the word," providing demonstrations, sharing

best practices, and possibly even serving as mentors or consultants to their peers, engaging in real time problem solving as difficulties or questions inevitably arise.

The transition process, however, takes longer than most leaders anticipate and too many strategic initiatives are dropped before true change takes hold (Worley, et. al., 1996). As timetables are developed, it is recommended that some degree of flexibility be built in to allow for unanticipated difficulties. In addition, too many leaders believe that change will just happen once technology is in place. In reality, however, they will need to continually shepherd the implementation past setbacks and lapses in performance due to the learning cycle.

The Organizational Leadership "online" experience

The Organizational Leadership department includes a small group of faculty within the College of Business on a regional commuter campus of approximately 3600 students, located in the midwestern United States. Our service area encompasses a three county area, and historically, the majority of students have been primarily non-traditional, working adults. Although the non-traditional population has remained steady, over the past five years, this campus has enjoyed an influx of more traditional, college-age students as well. Regardless of their position in life however, most of the students who enroll at our institution struggle with balancing work, school and family commitments. Most of the Organizational Leadership coursework in the past has been offered using a traditional classroom-based format, although a few members have dabbled with incorporating some supportive online components.

Strategic analysis: Retention and competition

As the number of online providers continues to grow and become more of a presence within our area, and the technological literacy of the student body increases, faculty members have been asked with increasing frequency about the availability of online offerings. A good percentage of the time, when a student received the reply, "I am sorry, we do not," the reaction of the student was simply to find a provider that did. We began to see a steady stream of students pursuing similar coursework offered in an online format from other providers. Once they had completed the courses, they would have the credits transferred back to our University relatively seamlessly

as our institution is required by the Commission of Higher Education to accept transfer credits as part of a state-wide agreement.

If we did offer a course with a significant online component, it was not uncommon during the registration period for it to quickly fill to capacity first. The primary users of online coursework in this institution are students who reside locally and are interested in the added flexibility as a way to meet competing demands on their time. The use of an online format would serve as a retention tool rather than a recruitment tool. It was rare for the online student to be a new student residing in a remote location in need of access.

Strategy making: Going online with limited resources

In light of the increased student demand as well as the growing number of competitors, we decided to meet to develop a strategy to address this issue. A retreat was held to consider possible alternatives and it resulted in the decision to plunge into the online world, as a way to meet the growing demand and retain our students. In addition to external pressures, the group also felt that the move to an online format would create internally, a niche for the Organizational Leadership program not filled by any other program on campus. It was also fortuitous that all members of the group were comfortable with technology, fairly new to the academic world, and therefore more amenable to adoption of this strategy. Resistance to change was not a significant challenge as it may be in other institutions. Even in light of considerable faculty interest and motivation to pursue teaching online, the strategic decisions regarding breadth, aggressiveness, logic, and orchestration would need to be made in light of limited resources.

A web-based course delivery system was already available at our institution, but there was little adoption in any consistent manner across the campus. In addition, the university employed only one designated support staff person to provide training and troubleshooting for the entire faculty. Fortunately, a few faculty members from other departments, who had some experience with online formats, offered to serve as an additional resource for the group. Campus leadership was neutral on this issue, neither supporting nor discouraging any initiatives, although the department chair was strongly supportive. The opinions of effectiveness of online formats also varied among our colleagues across disciplines, ranging from "everything can be done online" to "online

learning will never be appropriate." Although our Organizational Leadership group was unanimous in our decision to develop an online presence, other members within the College of Business failed to see the benefits. One strong cultural value which did support implementation however, was the strong institutional emphasis on teaching, which did enjoy parity with research in the promotion and tenure process.

Strategic plan design: Dissemination via staging

Although we chose to adopt the online technology, other implementation issues to be considered included workload and time constraints, competency development, and course sequencing. We decided to pilot the initiative by offering nine courses in a sequence that lead up to a certificate in Leadership. The decision to include a specific course or not was also based on the group's determination of how easily the content fit into the online format. Instead of creating the entire certificate at the outset, a logical sequence of course offerings was determined and development was planned over time. Those courses which typically required significant group and class discussions (such as a labor relations course which included an online negotiation component in addition to regular asynchronous discussions) were added later in the process. As each member's level of competence and comfort grew over time, more complex components were developed and added.

Implementation: Dialogue and support

Initially, each member attended a workshop offered by the IT department which provided a basic overview of the application. We then relied on each other's expertise to develop the actual structure of each course. Due to other professional commitments and workload constraints, courses were developed in sequence, one per faculty member per term, over a three year period. The schedule was determined jointly by all of us, based on the logical progression of content as well as personal readiness. To ease the impact of development time and prevent a steep learning curve, each member gradually developed their coursework for online use by first using the technology as an enhancement to courses offered on-campus. Offerings evolved over time from the traditional classroom based format to a blended format (part online, part in class), to a completely online format. The gradual pace chosen in this case kept the implementation manageable, minimized burnout and discouragement, and increased the likelihood of success.

Development of a course during the summer session which is typically devoid of many service demands associated with the regular semester was another strategy used to help ease workload pressures.

To assist in learning and the sharing of best practices, we were enrolled as "auditors" in each other's courses to observe aspects such as overall organization, content, assignments, grading schemes, exam construction, and facilitation of online discussions. The close proximity of our offices also facilitated "just in time" learning and troubleshooting throughout the development process as well as during the actual delivery phase. We continue our dialogue even now. The process of "auditing" will also continue but will move from a learning function to a platform for peer review. An online teaching evaluation form is also in the process of being developed by our institution to capture student feedback and satisfaction with their experience.

To date, the program is in its final year of development, and the last two courses of the nine course certificate are presently being offered online. The demand continues to exceed the supply and online courses continue to fill to capacity before those offered on campus. Student feedback has been extremely positive. Plans to expand beyond the certificate are underway. As other departments begin to follow suit, it will become easier to work towards an online degree. Although the original intent of the online certificate was to retain the current students, we have also decided to expand the reach of the University to those potential students residing in more remote areas.

Faculty members have also discovered an additional benefit to the online format as it does provide for some flexibility for them as well. There is a tradeoff however, as a few members of the group have discovered. Whatever flexibility was gained, the benefit was lost by spending more time on task. Some still struggle with managing their time as they feel compelled to be available around the clock to check discussions and provide input. We continue to seek a workable balance and one very experienced colleague has recommended the establishment of virtual "office hours" as a way to manage time and availability.

Other effects of implementation: The ARCS model in action

The process of sharing best practices through casual conversation continues, and others within the College of Business have begun to join the dialogue. To date, our entire group has worked through the implementation process and some of us prefer the online format more than others. All members have agreed however to continue to offer at least one online section per semester. Currently, work has begun to mentor part time instructors in a similar fashion: by starting slowly, sharing access to current online sections, and developing competency over time. As this is a teaching institution, faculty members have been recognized and rewarded for their work to enhance teaching and learning both in the annual review and promotion and tenure processes. Two have become "champions" for the campus and serve on a newly created technical advisory committee. In addition, the process of developing and facilitating online learning has provided an outlet for professional development and scholarly activity. One member of the faculty is completing his dissertation research on online learning, and others have written and presented papers related to teaching effectiveness.

Conclusion

Although there are many factors such as increased competition and student demand exerting pressure on institutions of higher education to adopt educational technology, the process for doing so involves more than merely installing a product. The choice to implement a new technology and the extent and speed of its adoption depends upon internal factors such as resources, organizational culture, faculty readiness, anticipated degree of resistance, and the degree of variance from the status quo. Using the framework outlined in this article which includes analysis, strategy making, design and implementation, can help educators make decisions and facilitate change in a manner that works within their system, ultimately increasing the likelihood of success. In this case, once the decision was made by the group to offer a series of online courses, a plan for implementation provided a process for doing so, even when constrained by considerable resource limitations. This was accomplished through the sequential transition of the format from traditional to electronic, allowing each faculty member to develop competency over time as their workload permitted. The implementation process was facilitated by peer mentoring, continuous collaboration, and support of the process by the leadership as well

as all members. Based on the success of the limited trial, efforts are currently underway to expand program offerings.

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